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River near Chicago." *Dodecatheon Meadia*, L., var. *Frenchii*, Vasey, grows there at the base of overhanging cliffs. It is smaller than the usual form, has fewer flowers and thin ovate-cordate leaves on margined petioles, constituting a well-marked variety.—A. B. SEYMOUR.

The female Flowers of Coniferæ.—Professor Eichler's paper on this subject, reviewed in the May number of this Journal, has induced Professor CELAKOVSKY to re-investigate this subject, morphologically so important, and to which he had already devoted much attention. In the Abhandl. d. K. Boehm. Ges. d. Wiss. he has recently published his present views, in an extensive article, illustrated by a plate. After reviewing the different theories and explanations enunciated since Robert Brown's time, he dwells emphatically on the great importance of the study of the *anamorphoses* (as he calls those monstrosities which are the result of retrograde metamorphosis, in contra-distinction to mere pathological alterations) and of the teachings they convey. He comes to the conclusion that these are a much safer guide than the microscopic study of the genesis of the organs, which has often misled those who too implicitly relied on its teachings. Investigating the anamorphoses of the Norway spruce, he finds the two lateral carpellary leaves distinctly indicated and more or less separated and developed. In more involved cases an anterior and then a posterior bract make their appearance; these, Professor Eichler had taken for a third and fourth lobe of his ligula. It must be stated here that normally the posterior bract is the third and the anterior the fourth in order. Celakovsky comes to the conclusion that, at least in *Abietineæ*, Eichler's theory (that the carpellary scale is a mere emergence or ligule of the bract) is quite wrong, and that Mohl's view (1871)*—that the carpellary scale of these plants consists of the two connate lowest leaves of an axillary, otherwise undeveloped, bud connate at their upper edge and producing the ovules on their back,— is amply vindicated by all known morphological facts and is antagonistic to none of them.

He further concedes that the same explanation may possibly be the true one for all conifers, and that all morphologists who have treated this question thus far, have, whatever their views, assumed a conformity in this respect in all the tribes of conifers, and a complete homology of their female organs. But he thinks

* It appears now that A. Braun has expressed the same view as early as 1842 in the French *Congres scientifique* at Strasburg, in the report of whose proceedings it is published. He often threw out such hints from the rich treasures of his investigations, but with characteristic modesty he gave them to science without urging them or claiming scientific property or priority in them.

that this is not necessarily so, and that Sachs' and Eichler's emergence or ligular theory may be true as to *Araucarieæ*, and that thus the cone of these plants is really and truly a single flower. In regard to *Taxodineæ* and *Cupressineæ* he is convinced that an inner fruit scale really exists, completely adnate to the bract and soon outgrowing it, but he does not venture to pronounce on its nature, because he thus far has no ocular demonstration of it through any anamorphosis.† Professor Celakovsky concludes that the arillus of *Taxaceæ* corresponds with the ligula of *Araucarieæ*. He speaks of the *terminal* position of the ovule in this tribe as of very little morphological importance, being really a lateral ovule pushed to the top of an axis.‡

It will be of interest to those who have been misled by contrary statements, to learn that O. Heer, the celebrated phyto-paleontologist, has shown that geologically *Abietineæ* and *Taxodineæ* are the oldest conifers now known, appearing already in the Carboniferous period, while *Araucarieæ* come up much later in the Trias and Jurassic formations. But relative geological age of the different tribes of plants is of much less importance for the appreciation of their degree of development and their position in the system than some suppose. Thus the *Cycadeæ*, the Phænogams most closely allied to the vascular cryptogams, are, as Professor Heer states, very uncertain in the Carboniferous, and make their decided appearance first in the Permian rocks; therefore much later than the higher developed conifers.—G. E. *in Am. Jour. Sci.*

Limits of Michigan Plants.—The distribution of plants along the Great Lakes is a subject of much interest. The equalizing influence of the Lakes upon the climate of Michigan and adjacent states has resulted apparently in bringing together the two extremes of the floras considerably north and south of them. The mild winters allow southern species to come in, while the cool summers are favorable to the growth of more northern species.

† The writer of this is in posession of a proliferous cone of *Sequoia gigantea* which seems to prove, not only that the fruit scale in this species (and consequently in the whole tribe) is homolgous with that of *Abietineæ*, in so far as it consists of leaves of an axillary shoot, yet that these leaves are not a single pair, but, as A. Braun has long ago suggested, in regard to *Cupressineæ*, that there is a number of leaves, laterally coordinate and connate, bearing a number of ovules on their back.

‡ It might be well to draw attention to the singular fact, that in the allied gymnospermous family of *Gnetaceæ*, the female flower (for such it is now assumed to be, the outer integument or utricle being considered as a two-leafed carpel) is always referred to as "terminal," whether single, double or triple, while a terminal organ can not be otherwise than single. The fact is that the female flowers are here axillary in the axils of one or more of the uppermost bracts, and, if single, are pushed to the top of the shoot.